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Auditable Safety Analysis Report for TAN-653

Revision 1

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Auditable Safety Analysis Report for TAN-653 Waste Consolidation Facility

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Assistant Secretary for
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EXECUTIVE SUMMARY

E.1 Facility Background and Mission

The Test Area North (TAN) Waste Consolidation Facility (TAN-653) is used for storage and handling of hazardous waste.

E.2 Facility Overview

This document covers only the storage and maintenance operations in TAN-653. Facility specific safety analyses and the unreviewed safety question (USQ) process provide coverage for other activities or operations as needed.

E.3 Facility Hazard Classification

Based upon DOE-ID N 420.A1, the TAN 653 Waste Consolidation Facility (WCF) is classified as a low hazard non-nuclear facility activity that requires an Auditable Safety Analysis (ASA). The ASA does not require Department of Energy Idaho Operations Office (DOE-ID) approval.

E.4 Safety Analysis Overview

The hazard and accident analysis of the WCF did not identify any accidents that require additional controls other than the application of in-place administrative programs such as the radiological protection program.

E.5 Organizations

The management and operations contractor for TAN is responsible for the operation of the WCF. The contractor has delegated the day to day operations to the Waste Generator Services Group (WGS).

E.6 Safety Analysis Conclusions

The safety analysis of TAN-653 demonstrates that protection of public and worker health and safety, and the environment is acceptable.

E.7 ASA Organization

The activities of the WCF are addressed using the 21 Safety Analysis Report (SAR) topics outlined in DOE Order 5480.23 and is organized in a 17-chapter format that follows the guidelines of DOE-STD-3009-94. A number of the chapters in this safety analysis reference the Test Area North Operations (TANO) SAR for information applicable to all TANO facilities and operations.

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FIGURES

TABLES

ACRONYMS

ACM	asbestos containing material
ALARA	as low as reasonably achievable
ANP	Aircraft Nuclear Propulsion
ANS	American Nuclear Society
ANSI	American National Standards Institute
ASA	Auditable Safety Analysis
BBWI	Bechtel BWXT Idaho, LLC
CAM	Continuous Air Monitor
CFA	Central Facilities Area
CTF	Contained Test Facility
D&D	decontamination and decommissioning
DOE	Department of Energy
DOE-ID	Department of Energy Idaho Operations Office
ES&H	Environmental Safety and Health
HEPA	High Efficiency Particulate Air
INEEL	Idaho National Engineering and Environmental Laboratory
ISM	Integrated Safety Management
MAR	Material At Risk
MCP	Management Control Procedure
OSR	Operational Safety Requirement
OU	Operable Units
PCB	polychlorinated biphenyls
RAM	Remote Area Monitor
RCRA	Resource Conservation and Recovery Act
RWMC	Radioactive Waste Management Complex

SAA	satellite accumulation area
SAR	Safety Analysis Report
SMC	Specific Manufacturing Capability
SSCs	structures, systems, and components
TAA	temporary accumulation area
TAN	Test Area North
TANO	Test Area North Operations
TCE	trichloroethylene
TSCA	Toxic Substance Control Act
TSF	Technical Support Facility
TSR	technical safety requirement
USQ	Unreviewed Safety Question
VPP	Voluntary Protection Program
WAG	Waste Area Group
WCF	Waste Consolidation Facility
WGS	Waste Generator Services
WRRTF	Water Reactor Research Test Facility

Auditable Safety Analysis Report for TAN-653

1. SITE CHARACTERISTICS

1.1 Introduction

The Idaho National Engineering and Environmental Laboratory (INEEL) was established in 1949 as the National Reactor Testing Station on land formerly used as a United States Navy weapons proving ground. The National Reactor Testing Station was named a national laboratory by congressional action in 1974, at which time the name was changed to the Idaho National Engineering Laboratory. The laboratories name changed in 1997 to the Idaho National Engineering and Environmental Laboratory. The original INEEL mission was to build, test, and operate various nuclear reactors and associated facilities. The isolated location ensured maximum public safety in the then unfamiliar field of nuclear research. Today, the INEEL is a United States Department of Energy (DOE) multi-program laboratory; its primary mission is to provide the nation with innovations in nuclear technologies and unique scientific and engineering capabilities in non-nuclear programs that provide commercialization potential or enhance the quality of the environment.

Detailed descriptions of site geography, demography, land use, meteorology, hydrology, geology, seismology and other natural phenomena threats, external man-made threats, and nearby facilities can be found in the *Safety Analysis Report for Test Area North Operations at the Idaho National Engineering and Environmental Laboratory,* (hereafter referred to as the TANO SAR).[1]

1.2 Reference

1. *Safety Analysis Report for Test Area North Operations at the Idaho National Engineering and Environmental Laboratory*, INEL-94/0163, March 1999.

2. FACILITY DESCRIPTION

2.1 Introduction

This chapter provides a description of theTAN-653 WCF and facilities at TAN that are associated with this building.

2.2 Facility Overview

TAN is located on the north end of the INEEL approximately 27 miles from Central Facilities Area (CFA). TAN was originally established in the 1950s to support the U.S. Air Force Aircraft Nuclear Propulsion (ANP) Program. TAN encompasses the following areas:

- Technical Support Facility (TSF)—consists of facilities for handling, storing, examining, and research and development activities associated with spent nuclear fuel.
- Water Reactor Research Test Facility (WRRTF)—consists of two buildings southeast of the TSF that have housed several non-nuclear tests, mostly for simulating and testing water systems used in reactors. This facility performs research and development activities such as explosive detection systems for the Federal Aviation Administration and the Matched Index Refraction Project.
- Contained Test Facility (CTF) and Specific Manufacturing Capability (SMC) consists of contiguous facilities west of TSF that includes structures built for those two operations, and old buildings from the former ANP program. CTF was constructed for nuclear reactor testing and has been decommissioned. SMC is an active facility that manufactures components for a U.S. Department of Defense.
- Initial Engine Test (IET) facility—consists of an abandoned facility north of TSF that had numerous historical uses. Initial Engine Test facility was designed as a testing location for the nuclear jet engines developed under the ANP program in the 1950s and early 1960s. IET has been demolished and is in the final stages of environmental restoration.

2.2.1 TAN-653

TAN-653 provides a centralized location for Waste Generator Services (WGS) and waste storage at TAN and is located at the TSF east of TAN-607. Currently, WGS personnel and operations are located in different areas throughout the TAN facility. As part of implementing WGS at TAN, personnel and operations are to be moved to TAN-653 to better serve TAN operations. As part of this service, WGS manages waste including storage activities. TAN-653 provides office space for approximately seven WGS personnel with the potential for up to 20 offices.

Operations include storing waste inside TAN-653 and within nearby outside fenced areas, sampling non-radioactive containers, sampling radioactive containers, preparing lab-packs for shipment, consolidating wastes into packages of compatible materials, palletizing waste drums and preparation for shipment, loading and unloading vehicles, and back-shift inspections. Modifications to support operations may include setting up tables and benches, and removing shelves. TAN-653 combines some of the waste storage areas at TAN including centralized satellite accumulation areas (SAAs) and temporary accumulation areas (TAAs). Solid, radioactive, hazardous, and mixed waste will be

temporarily stored and managed in TAN-653. Vermiculite storage will also be set up for packaging lab packs.

Materials received may include acids, bases, oxidizers, organics, corrosives, explosives, radioactive material and radioactively contaminated material, flammables, and non-hazardous solid wastes. Table 2-1 outlines typical contents and quantities (not limits) of materials to be stored or used in TAN-653.[1]

Table 2-1. Typical Contents of TAN-653.

Material	Typical Quantity (gallons)
55 gal flammable storage cabinets	110
Flammable storage cabinet	50
Conditional Industrial wastes	2,200
Acids	220
Bases	220
Oxidizers	220
Organics	220
Pesticides	55
Inorganic Solids	550
Silver/Lead	110 (2000 lbs)
Battery Storage	55
Oil Dumpster	500
Oil Drums	440
Ethylene glycol mixture	55
Radioactive Water w/ F001 codes	220
Radioactive Water non hazardous	1,100
Liquid Low Level Radioactive Waste	110
Containerized Asbestos	282[a]
Containerized solid radioactive wastes	1411[a]

a. Quantity expressed is cubic feet.

In addition, waste from environmental remediation activities may be received at TAN-653. Because the INEEL is too expansive to be cleaned as a single site, it is divided into 10 Waste Area Groups (WAGs) which focus on environmental remediation efforts. TAN is located in WAG 1. Environmental Restoration Program activities in WAG 1 at TAN encompass 10 Operable Units (OU) with 83 sites.[2] Hazardous, radioactive, and mixed wastes exist at WAG 1 and may be received at TAN-653 for temporary storage. The 10 OUs are summarized as follows:

OU 1-01	Three underground storage tanks , a gravel pit, a rubble pit, three below ground pits, three clarifier pits, and an injection well
OU 1-02	Fifteen petroleum/fuel waste storage tanks
OU 1-03	Two burn pits, a gasoline spill, bottle dump site
OU 1-04	A sump, two ponds, three pits, and a tank
OU 1-05	Nine radioactively contaminated sites: IET stack, IET rubble site, IET hot waste tank, TSF TAN/TSF-1 area, TSF intermediate level waste disposal system, TSF drainage pond, TSF contaminated tank, TSF IET valve pit, TSF PM-2A tanks and WRRTF radioactive liquid waste tank
OU 1-06	Four old spill and disposal sites: 5,000-gal diesel spill, 10-gal sulfuric acid spill,1-gal mercury spill, and disposal pond for TSF sanitary and process wastes
OU 1-07	TSF-05 injection well and groundwater contamination from injection of waste waters into the Snake River Plain Aquifer
OU 1-08	Railroad turntable at TSF, TSF sewage treatment plant and sludge drying beds, injection well at WRRTF, and fuel oil leak
OU 1-09	Three disposal ponds at WRRTF, French drainsite, and well water spill
OU 1-10	Comprehensive RI/FS for WAG 1 that coordinates all cleanup work requiring characterization at the other WAG 1 OUs and a leach field for paint wastes.

TAN-653 will also receive material from the Material Exchange Program such as laboratory chemicals, paint, caulking, dye penetrant, lubricants, grease, acetone, cement, and other materials of value that may be exchanged with other government users on and off the INEEL. Resource Conservation and Recovery Act (RCRA) recyclables will be stored in TAN-653 as well. These materials include items such as lead, silver, mercury, used oil, batteries, and other materials of value and are exempt from the RCRA disposition requirements. Vehicles may be stored for short periods of time.

2.3 Facility Structure

TAN-653 will be used for temporary storage of hazardous wastes and waste materials until their final disposition to the Radioactive Waste Management Complex (RWMC), Waste Experimental Reduction Facility (WERF), or other onsite or offsite disposal facilities.

TAN-653 is a corrugated, two-story steel warehouse originally constructed in 1985. Approximately three fourths of the building is an open bay area with a two-story office area on the east end. It is rectangular in design, 45 ft × 125 ft and is built on a 4 in. concrete slab. The concrete floor has drains that have been plugged to preclude the spread of contamination or hazardous materials into the sanitary sewer system. Figure 2-1 shows the floor plan. The facility has two 1-ton overhead coffing hoists that may be used to move waste material drums within the facility. Electrical service is provided to the building through a 480-volt switchgear panel on the south wall. The building is provided with its own air handling system and water heaters. Emergency equipment includes emergency lighting, fire extinguishers, public address system, and smoke detectors within the office spaces. There is a roll-up door on the south end of the building, through which materials are received.

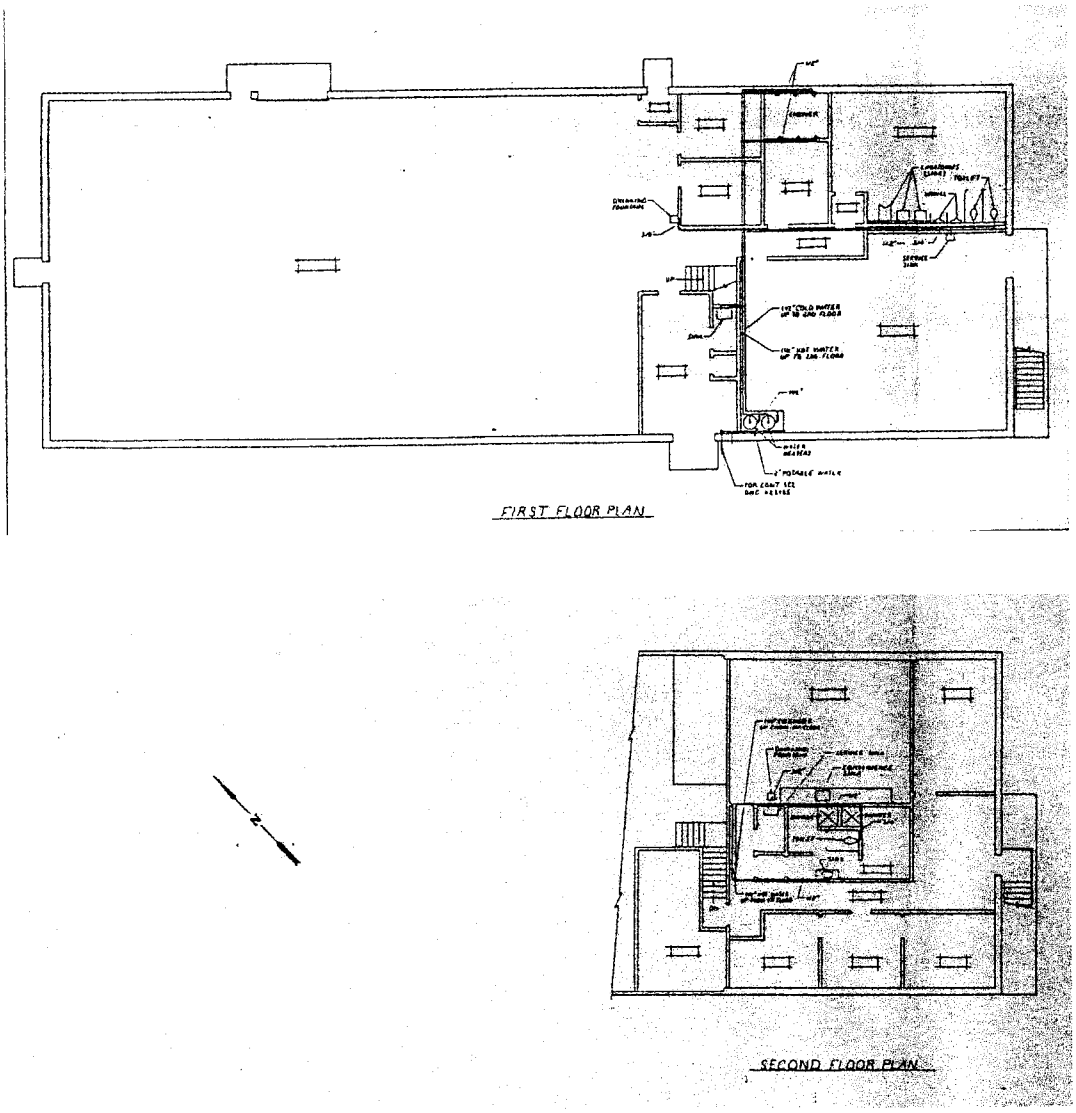

Figure 2-1. TAN-653 Floor Plan (first and second floor).

2.4 Process Description

TAN-653 will be used as a central TAA for the TAN area facilities. Materials meeting the requirements of this ASA will be stored in an SAA until 55 gallons have accumulated, then the material will be placed in a TAA. TAAs have a 90-day time limit, and waste or other materials placed in the TAA will be removed to a permanent disposal facility within this time limit. Materials that cannot be placed into TAN-653 will be maintained at the generator facility until disposition.

Processes in TAN-653 include:

- Sampling non-radioactive and/or hazardous material containers

- Sampling radioactive and/or hazardous material containers
- Generator treatments of radioactive and/or hazardous wastes which do not introduce unanalyzed significant hazards or introduce materials in excess of threshold limits [(e.g., sparging barrels containing water generated from well samples to remove trace quantities of trichloroethylene (TCE)]
- Preparing lab-packs for shipment
- Material Exchange Program
- RCRA Recyclable Program
- Consolidating wastes into packages of compatible materials
- Palletizing waste drums and preparation for shipment
- Loading and unloading vehicles.

The Material Exchange Program is a government-wide program to reduce waste by exchanging materials of value with other government agencies. Materials may accumulate at TAN-653 for up to one year from receipt from any INEEL producer and may be released to any government agency. The Material Exchange Program would be managed in a specific storage area designated in TAN-653. Similarly the RCRA Recyclable Program accumulates materials of value for recycling. Recyclable materials are not subject to RCRA disposition requirements and therefore may accumulate indefinitely.

There is the potential for unidentified materials to be placed in this facility. The exact composition of the material may not be known, but the hazard or properties of the material may be. For example, it may be known that the material is a corrosive or flammable but the exact chemical composition such as sulfuric acid or methanol may not be known. Waste drums received and stored at TAN-653 are normally sealed but may need to be routinely vented for gas generation considerations.

2.5 Confinement Systems

TAN-653 provides for confinement of material releases in a crude sense only. There is no High Efficiency Particulate Air (HEPA) filtration for the ventilation system of this building. In addition materials stored outside the facility in a fenced enclosure have only liquid confinement due to the presence of a dike/berm. Storage containers such as 55-gallon drums and B-25 waste boxes provide primary confinement.

2.6 Safety Support System

Engineered safety features and safety class structures, systems, and components (SSCs) are not required for an SAA or TAA that is classified as a Hazard Category 3 or below. For the activities within TAN-653, the unmitigated release of the available inventory of radioactive and/or hazardous material has the potential for only localized consequences.

Structures, systems, and components important to worker safety may be required for TAA activities. Standard industrial controls apply for areas such as electrical and fire safety. Worker safety SSCs include:

- Fire extinguishers
- Fire sprinkler system
- Fire alarm system
- Emergency egress lighting
- Smoke detectors
- Public address system.

2.7 Utility Distribution Systems

This section describes the utilities required to perform SAA and TAA activities. The major focus is on those utilities required for the safety of personnel, the public, and the environment.

The utilities that are necessary to support TAN-653 in accordance with federal regulations, DOE Orders and BBWI procedures including the National Electric Code, Occupational Safety and Health Act and DOE Order 420.1 Facility Safety [3] are:

- Electrical distribution
- Water service (potable and fire water systems)
- Sanitary sewer.
- PDS computer service.

2.8 Auxiliary Systems and Support Facilities

TAN-653 requires support from INEEL facilities and TAN services. Supporting facilities include waste storage, treatment and disposal facilities, personnel support facilities for sanitation, staging areas, and offices. Services required in support of TAN-653 include fire protection, security, emergency response personnel and equipment, and transportation of radioactive, hazardous, and solid waste.

Supporting facilities and services may also include:

- Decontamination
- Radio communications
- Fire brigade
- Respirable air supply

- Emergency egress considerations
- Confined space testing
- Underground utility locating services.

2.9 References

1. D. E. Sheldon, notegram to S. M. Thraen, "Contents of TAN 653," January 1999.

2. DOE/ID-10474, "Idaho National Engineering Laboratory Environmental Restoration Program Baseline Safety Analysis File (BSAF)," Revision 2, U. S. Department of Energy Idaho Operations Office, September 1995.

3. DOE Order 420.1, "Facility Safety," U. S. Department of Energy, October 15, 1995.

3. HAZARD AND ACCIDENT ANALYSIS

3.1 Introduction

This chapter presents the methodology and results of the hazard analysis of the activities conducted in TAN-653. From the hazards analysis, representative, unique, and/or bounding accidents requiring further analysis are selected, and results of the accident analysis are presented.

3.2 Requirements

Guidance on performing hazard analysis, determining the hazard classification, and developing accident analysis includes:

DOE Order 5480.23, "Nuclear Safety Analysis Reports"[1]

DOE-STD-1027-92, "Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports"[2]

DOE-STD-3009-94, "Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports"[3]

For facilities that have inventories of radiological or hazardous materials less than the threshold criteria in the above stated references, the following documents have been used:

DOE-STD-5502-94, "Hazard Baseline Documentation"[4]

DOE ID Notice 420.A1, "Safety Basis Review and Approval Process."[5]

3.3 Hazard Analysis

3.3.1 Methodology

The methodology used to identify and evaluate potential hazards to workers, members of the public, and the environment from the use of TAN-653, is described in the following subsections and is consistent with the requirements listed in Section 3.2.

3.3.1.1 Hazard Identification. Standardized checklists of potential hazardous materials and energy sources and occupational hazards were used to support and document the identification of hazards and to ensure completeness. Hazards were identified through discussions with personnel, review of historical records for similar activities and a walkdown of the facility and similar facilities.

3.3.1.2 Hazard Evaluation. The operation of TAN-653 has been analyzed in accordance with INEEL and DOE standards listed above. Hazards associated with TAN-653 operations that have been evaluated are identified below.

3.3.2 Hazard Analysis Results

3.3.2.1 Hazard Identification. The following hazards have been evaluated:

- Criticality
- Fire
-
- Hoisting and rigging
- Hazardous chemicals
- Radiological issues.

TAN-653 Hazard Classification. Hazard categorization requires that: (1) all hazards, including contaminates and their potentially releasable quantities be identified, (2) contaminant releasable quantities be compared to corresponding categorization threshold quantities(TQs), (3) ratios of the releasable quantities to the threshold quantities be summed, and (4) facilities or activities be classified. The following DOE documentation: (1) DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Technique for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*[2] and (2) DOE-EM-STD-5502-94, *Hazard Baseline Documentation*[4], provide a methodology for determining the hazard classification of facilities or activities involving radioactive and/or hazardous material. **Based on DOE-**STD-1027-92, the potential releasable quantities of radioactive materials are compared to Attachment 1 of DOE-STD-1027-92 or Los Alamos National Laboratory Report LA-12981-MS.[5]

DOE-EM-STD-5502-94 requires further classification to establish whether the characterization activity falls under the designation of a radiological facility, non-nuclear facility, or other industrial facility. First the potential releasable quantities of radioactive material RQs are compared to Appendix B of 40 CFR 302[6]. The potential releasable quantities of radioactive material in TAN-653 does not exceed the Appendix B table. TAN-653 exceeds this table which concludes that TAN-653 is a non-nuclear facility. The releasable hazardous chemicals are then compared to 40 CFR 302.4 Table.

DOE-ID Notice ID N 420.A1 Safety Basis and Review Process[7] requires that the facility be further classified as a low, moderate, or high hazard facility. TAN-653 is classified as a low hazard facility based on the following critieria:

- The activity could not have potential personnel radiation exposure from sealed radioactive sources, radiation-producing devices, or non-releasable radioactive material in excess of a total effective dose equivalent (TEDE) of 2 rem from a single event.
- The activity could not have material at risk (MAR) quantities of hazardous material that meet or exceed the 29 CFR 1910.19[8] threshold quantities (TQs) or the 40 CFR 355[9] threshold planning quantities (TPQs).
- The activity could not potentially result in any increased risk to the off-site public.
- The activity could not potentially result in any environmental perturbations other than those which would be temporarily and totally restorable in nature, thereby resulting in no environmental impact.

Based upon the previous criteria in DOE-EM-STD-5502-94 and DOE ID N 420.A1, TAN-653 has been classified as a non-nuclear, low hazard facility, which was approved by DOE-ID.[10]

3.3.2.2 Hazard Evaluation. The hazard types and sources identified for TAN-653 consist of those identified in 3.3.2.1. No non-routine hazards are present except for radiation exposure to workers. Radiation protection during normal operations is addressed in Chapter 7. The hazards identified in Section 3.3.2.1 are discussed below.

3.3.2.2.1 ***Criticality***—Operations within the facility do not pose a criticality hazard. Components coming into the facility have been decontaminated and flushed. Equipment that originated in TAN facilities may contain small quantities of ^{235}U. However, administrative controls currently in place require that components taken from process areas for decontamination are evaluated for the presence of alpha emitting isotopes and special nuclear materials. Additionally, the radiation levels from associated fission products would preclude equipment with large amounts of ^{235}U from being brought into the facility without first being decontaminated. Finally, an administrative limit of less than 15 gm of ^{235}U restricts TAN-653 from formal criticality controls in accordance with the Criticality Safety Program Requirements Manual, PRD-112. Criticality protection is discussed further in Chapter 6.

3.3.2.2.2 ***Fire***—The facility is equipped with an overhead wet sprinkler system with galvanized piping. In addition, portable, hand-held, fire extinguishers are available within the facility for use. No bulk chemical storage is allowed in the facility. Any flammable, corrosive, or otherwise hazardous materials used or stored in the facility are in small volume vessels. Combustibles are controlled in accordance with company procedures.

3.3.2.2.3 ***Hoisting and Rigging***—The overhead hoist used in the facility for placement of waste drums and other large items is operated in accordance with procedures that comply with the requirements of the DOE Hoisting and Rigging Standard.[11]

3.3.2.2.4 ***Hazardous Chemicals***—The quantities of hazardous chemicals present in the facility are normally limited to small containers and the inventories are maintained below the threshold planning quantities defined in 29 CFR 1910.119 and 40 CFR 355, Appendix A. In addition, water is generated from the sampling of wells as part of the groundwater monitoring process. Samples of this water have shown the presence of TCE in the parts per billion range which classifies this as a hazardous waste.[6] This water will be brought to TAN-653. For threshold determination purposes at TAN-653, the weight of the water will be ignored and only the weight of the TCE will be considered. This same philosophy will be used in all cases in which a small quantity (by weight) of an F-coded waste (listed in 40 CFR 302) is present in a non-hazardous media (i.e., water). Chemicals and other hazardous materials are handled in accordance with company procedures for storage, handling and disposal. Data for FY 1999 has been collected and examined for TAN and SMC and shows that waste can be maintained below the above threshold limits.

Requirement of this ASA:

Inventory surveillances shall be performed to ensure that the 29 CFR 1910.119/40 CFR 355 threshold limits have not been exceeded.

3.3.2.2.5 ***Radiological Issues***—Radiological safety in the facility is addressed by approved procedures. These procedures are in compliance with the INEL Radiological Control Manual (RCM).[13]

The storage areas of the building are maintained as a radiologically "clean" area as defined in the RCM. The Radiological Material Areas for Storage (RMAs) are maintained as controlled areas, but are also maintained as "clean areas" as required by the RCM. Radiation and contamination surveys are routinely performed in the facility by radiological control technicians. Personnel working at the facility may be required to wear protective equipment (i.e. gloves, clothing etc) as prescribed on a radiological work permit.

Packages containing contaminated equipment are surveyed prior to being placed in storage. To reduce the potential for the spread of contamination, packages are not opened in the storage building unless controlled by procedures directed by the RCM and radiological control personnel.

Remote handled waste from TAN and V-tank waste (located in TAN-624) will not be stored in TAN-653.

Remote area monitors (RAMs), continuous air monitors (CAMs) or high-volume air grab samples are used in the facility as necessary to assure compliance with radiological control procedures directed by the RCM.

Requirement of this ASA:

Inventory surveillances shall be performed to ensure that TAN-653 remains below the Category 3 threshold limit[2] and non-nuclear facility limit as defined by 40 CFR 302.4 Appendix B Reportable Quantities.[6]

3.4 References

1. DOE Order 5480.23, "Nuclear Safety Analysis Reports," U.S. Department of Energy, April 1992.

2. DOE-STD-1027-92, "Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports," U.S. Department of Energy, December 1992.

3. DOE-STD-3009-94, "Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports," U.S. Department of Energy, July 1994.

4. DOE-STD-5502-94, "Hazard Baseline Documentation," U.S. Department of Energy, August 1994.

5. J. Clow, J. Elder, G. Heindel, W. Inkret, G. Miller, *Table of DOE-STD-1027-92 Hazard Category 3 Threshold Quantities for the ICRP-30 List of 757 Radionuclides*, LA-12981-MS, Los Alamos National Laboratory, August 1995.

6. 40 CFR, Part 302, "Designation, Reportable Quantities, and Notification," *Code of Federal Regulations*, Office of the Federal Register.

7. DOE-ID Notice 420.A1, "Safety Basis Review and Approval Process," U.S. Department of Energy, May 11, 1987.

8. 29 CFR 1910.119, "Hazardous Materials." *Code of Federal Regulations*, Office of the Federal Register.

9. 40 CFR 355, "Emergency Planning and Notification." *Code of Federal Regulations*, Office of the Federal Register.

10. R. M. Stallman, letter to G. O. Hayner, "TAN-653 Hazard Categorization," OPE-CFA/TAN-00-008, dated April 3, 2000.

11. DOE-STD-1090-96, "Hoisting and Rigging," U.S. Department of Energy, September 1996.

12. *INEL Radiological Control Manual*, January 1, 1995.

4. SAFETY STRUCTURES, SYSTEMS AND COMPONENTS

4.1 Introduction

No SSCs have been identified for TAN-653 whose failure would lead to unacceptable consequences to the public and facility workers from the activities performed in the facility.

5. DERIVATION OF ADMINISTRATIVE SAFETY REQUIREMENTS

5.1 Introduction

Administrative Safety Requirements are operational controls, which provide protection to workers and off-site public. According to DOE-ID N420.A1, "Safety Basis Review and Approval," OSRs are required for all moderate and high hazard non-nuclear facilities. The OSRs are contained in DOE approved document. Since TAN 653 is a low hazard facility, OSRs are not required. However, safety requirements are identified in this chapter as Administrative Safety Requirements. These requirements do not require DOE approval.

5.2 Administrative Safety Requirements

The following Administrative Safety Requirement is derived from Chapters 3 and 6 of this ASA:

Inventory surveillances shall be performed to ensure that the following limits for a low hazard, non-nuclear facility are not exceeded:

- Category 3 threshold limits as listed in DOE-STD-1027-92 and LA-12981-MS
- 29 CFR 1910.119 Threshold Quantities/40 CFR 355 Threshold Planning Quantities
- 40 CFR 302.4 Appendix B Reportable Quantities
- 15 grams of U-235 inside of TAN-653

5.3 References

1. DOE-ID N420.A1, "Safety Basis Review and Approval

6. INADVERTENT CRITICALITY PROTECTION

6.1 Introduction

This chapter presents information relevant to protection against inadvertent criticality during operations at TAN-653. Information relevant to the overall TAN criticality protection program and the general basis and analytical approach by which operational criticality limits are derived at TANO is presented in Chapter 6 of the TANO SAR.[1] The requirements for TAN criticality safety and protection program are contained in the Criticality Safety Program Requirements Manual.[2] The Criticality Safety Program requirements are governed by DOE Order 420.1[3] .

TAN-653 is administratively restricted to contain no greater than the equivalent of 15 g of ^{235}U inside the facility which is less than the minimum necessary for a criticality even under optimum conditions of moderation and geometry. Therefore, there are no criticality safety issues associated with operations at TAN-653.

6.2 References

1. *Safety Analysis Report for Test Area North Operations at the Idaho National Engineering and Environmental Laboratory*, INEL-94/0163, March 1999.

2. *Program Requirements Document For Criticality Safety Program Requirements Manual*, PRD-112, June 1998.

3. DOE Order 420.1, "Facility Safety," U.S. Department of Energy, October 24, 1996.

7. RADIATION PROTECTION

7.1 Introduction

Chapter 7 of the TANO SAR,[1] summarizes the provisions for the radiation protection program at TAN Operations. The objective of the radiation protection program is to maintain exposures to radiation from TAN Operations within prescribed limits and as low as reasonably achievable (ALARA). Activities at TAN-653 will be in accordance with the INEL Radiological Controls Manual[2] and company radiological procedures.

7.2 References

1. *Safety Analysis Report for Test Area North Operations at the Idaho National Engineering and Environmental Laboratory*, INEL 94/0163, March 1999.

2. *INEL Radiological Control Manual*, January 1, 1995.

8. HAZARDOUS MATERIAL PROTECTION

8.1 Introduction

Chapter 8 of the TANO SAR[1] summarizes the provisions for hazardous material protection at TAN and is applied to operations at TAN-653.

8.2 Reference

1. *Safety Analysis Report for Test Area North Operations at the Idaho National Engineering and Environmental Laboratory*, INEL 94/0163, March 1999.

9. RADIOACTIVE AND HAZARDOUS MATERIAL WASTE MANAGEMENT

9.1 Introduction

The general TANO and SMC radioactive and hazardous waste management program is described in Chapter 9 of the TANO SAR,[1] and Chapter 7 of the Safety Analysis Report for the Materials Development Facility[2] respectively. This section outlines waste management activities specific to the TAN-653 WCF.

9.2 Requirements

DOE Order 5820.2A, "Radioactive Waste Management," establishes the principal requirements for the management of expected waste from operations at the facilities listed in Section 2 of this ASA.

9.3 Radioactive and Hazardous Waste Management Program and Organization

WGS is the INEEL's waste management service group responsible for providing onsite and offsite waste generators disposition solutions for their legacy or newly generated wastes. WGS eliminates past waste management problems that occurred because of improper waste handling, multiple organizational interfaces, and poorly defined organization and personnel roles and responsibilities. WGS at TAN reports to TAN Engineering and Support Services manager and provides TAN with turnkey, professional waste management services ensuring compliant, safe, timely, and cost-effective disposition of legacy and newly generated wastes. WGS ensures all treatment, storage, or disposal requirements and waste acceptance criteria are followed and met. WGS will operate and maintain TAN-653 and support the facilities listed in Section 2.2 with waste management services.

9.4 Radioactive and Hazardous Waste Streams and Sources

Waste generation, handling, and storage operations at TAN-653 are performed in accordance with company waste handling procedures. Waste Generator Services is charged with the responsibility of handling the following containerized waste types at TAN:

Mixed Low-level Waste—Waste containing radioactive and hazardous constituents

Hazardous Waste—Waste defined by RCRA in 40 CFR 261.3 and is capable of causing adverse consequences when improperly treated, stored, disposed, transported, or otherwise managed

Low-Level Waste—Waste defined as "waste that contains radioactivity but is not classified as high-level waste, transuranic, spent nuclear fuel, or by-product materials, as defined in Section 11e(2) of the Atomic Energy Act of 1954 as Amended,[4] and may be contact or remote handled based upon radioactive levels measured at 1 meter

TSCA Wastes—Chemical wastes regulated by the Toxic Substance Control Act (TSCA) such as polychlorinated biphenyls (PCB)

Conditional Industrial Waste—Waste generated from typical manufacturing or industrial processes such as wood, oil and other type filters, oil contaminated soils and materials subject to a hazardous waste determination

Recyclable Hazardous Waste—Waste which is classified as hazardous but has some intrinsic value and is therefore retained for reuse or recycling such as silver and mercury

Waste with no Identifiable Path to Disposal—formerly known as Special Case or "LLW Greater than Class C" (per NRC SNM regulations). Materials include waste forms that do not meet RWMC disposal acceptance criteria, reactor core activated metals, and uncharacterized nuclear materials potentially greater than regulated levels as identified in 10CFR61.55.

In accordance with company procedures, an environmental checklist has been prepared for this facility.[3] The following summarizes the generation, handling and disposition of wastes and identifies waste streams and sources as presented in the environmental checklist.

Air Emissions—Radioactive and chemical emissions would be generated from sampling activities, sparging operations (as described in Section 2.4), repackaging activities and drum venting. Sampling of wastes containing radionuclide content above what this ASA will allow in TAN-653 would be transported to TAN-607 (Warm Shop or Hot Shop) for sampling. Setting up a tent in TAN-653 with the appropriate HEPA filters is an option being considered that may eventually be implemented. Vehicle emissions would be generated during loading/unloading activities as would equipment emissions, i.e., a forklift.

Asbestos—This activity includes providing waste storage designated for asbestos containing material (ACM). The ACM would be containerized and the volume would be approximately eight cubic meters.

Chemical Use—Chemicals may be stored for use in sampling activities. Also, the Material Exchange Program includes several chemicals available for use. All chemicals stored on-site would be stored according to applicable company procedures, guidelines, and safety procedures. Material Safety Data Sheets for all chemicals and chemical products used in support of the action would be available for review as required by 29 CFR 1910.1200 and Management Control Procedure (MCP)-2873, "INEEL Chemical Management System."

Solid Waste—This activity includes providing a waste storage area designated for solid waste. This waste stream could potentially include at any one time, drums of nonhazardous solid waste, batteries, and recyclable materials such as silver and lead. The approximate volume of solid waste would be 500 gallons.

There is a potential of generating new solid waste from administrative and sampling activities. This waste stream could include personal protective equipment and paper. Potential waste materials would be evaluated before generation for waste minimization and recycling possibilities in accordance with company and DOE policies. All waste would be evaluated and characterized by WGS. All nonhazardous, nonradioactive solid waste would be disposed of at the INEEL Landfill Complex according to the facility's waste acceptance criteria.

PCBs—Waste determined by knowledge or testing to contain regulated quantities of PCBs would be managed in TAN-653, in accordance with TSCA storage requirements. This area would include a 500 gallon dumpster and an area for approximately eight drums.

Hazardous Waste—TAN facility's centralized SAAs and TAAs will be moved to TAN-653 for consolidation and management. These waste streams could include acids, bases, oxidizers, organics, pesticides, inorganics, batteries, used oil, ethylene glycol, circuit boards, and light bulbs (fluorescent and incandescent). The approximate volume would be 2,500 gallons. The hazardous waste storage areas at TAN-628 and TAN-647 would not be moved to TAN-653. Should any existing SAAs and TAAs be closed as part of this action, they will be closed according to MCP-442 and MCP-443.

Radioactive Waste—A radioactive waste storage area would be provided for in TAN-653. This waste stream could include radioactive water and solid radioactive waste. The approximate volume of each waste type would be 1,100 gallons and 40 cubic meters, respectively. The radioactive waste storage area in TAN-648 will remain and not be moved to TAN-653. The wastes are disposed of according to approved procedures governed by the INEL RCM[5] and INEL Recyclable Property, ReUseable Material and Waste Acceptance Criteria.[6]

Mixed Waste—Centralized SAAs and TAAs for mixed waste storage in TAN-653 will be provided and used primarily for collecting and loading for transport to long-term storage or a treatment facility. This waste stream could include radioactive water with F001 codes. The approximate volume of this waste would be 220 gallons. As discussed in Section 3.3.2.3.4, water is generated from the sampling of wells as part of the groundwater monitoring process. Samples of this water have shown the presence of TCE in the parts per billion range which classifies this as a hazardous substance. This water will be processed (i.e., sparged as described in section 2.4) at TAN-653 and then disposed of according to approved procedures. The mixed waste storage areas at TAN-628 and TAN-647 would not be moved to TAN-653.

Radiation Exposure—Exposure would be managed in compliance with 10 CFR 835 "Occupational Radiation Protection," and the ALARA principle using time, distance, and shielding. The radiation exposure for personnel conducting these recovery efforts would comply with a radiation work permit that controls maximum exposure levels.

9.5 References

1. *Safety Analysis Report for Test Area North Operations at the Idaho National Engineering and Environmental Laboratory*, INEL-94/0163, March 1999.

2. *Safety Analysis Report for Specific Manufacturing Capabilities Production Facility*, SMC-RD-054, Revision 3, March 2000.

3. D.E. Sheldon, *Environmental Checklist*, TAN-99-001, January 25, 1999.

4. Atomic Energy Act of 1954 as Amended, Section 11e(2).

5. Lockheed Martin Idaho Technologies Company, *INEL Radiological Control Manual*, January 1, 1995.

5. DOE/ID-10381, "INEL Reusable Property, Recyclable Materials, and Waste Acceptance Criteria," U. S. Department of Energy Idaho Operations Office, August 24, 1995.

10. INITIAL TESTING, INSERVICE SURVEILLANCE, AND MAINTENANCE

10.1 Introduction

Chapter 10 of the TANO SAR[1] describes the essential features of the TANO initial testing and in-service surveillance and maintenance programs. Based on the hazard evaluation in Chapter 3, there are no requirements for initial testing, inservice surveillance, and maintenance. However, testing surveillance, and maintenance of equipment is performed in accordance with company procedures. These activities are primarily associated with active operations involving structures, systems and components (SSC) of safety related equipment. TAN-653 is a storage facility without complex operations or safety related SSCs.

10.2 Reference

1. *Safety Analysis Report for Test Area North Operations at the Idaho National Engineering and Environmental Laboratory*, INEL-94/0163, March 1999.

11. OPERATIONAL SAFETY

11.1 Introduction

Operational safety at TAN is described in Chapter 11 of the TANO SAR[1] and includes the 18 elements in DOE Order 5480.19, "Conduct of Operations."[2] Operations at TAN-653 are covered by the Conduct of Operations program at TAN.

References

1. *Safety Analysis Report for Test Area North Operations at the Idaho National Engineering and Environmental Laboratory*, INEL-94/0163, March 1999.

2. DOE Order 5480.19, "Conduct of Operations," U. S. Department of Energy.

3. Company Operations Manual.

12. PROCEDURES AND TRAINING

12.1 Introduction

Operations at TAN are conducted using current, approved procedures. Chapter 12 of the TANO SAR[1] summarizes the TANO procedures and training programs. There are no aspects of the development, maintenance, and modification of procedures or training that apply only to TAN 653.

12.2 Reference

1. *Safety Analysis Report for Test Area North Operations at the Idaho National Engineering and Environmental Laboratory*, INEL-94/0163, March 1999.

13. HUMAN FACTORS

13.1 Introduction

No specific human factors issues pertaining to Human-Machine Interfaces have been identified for TAN-653. Chapter 13 of the TANO SAR[1] describes the human factors processes applied at TAN.

13.2 Reference

1. *Safety Analysis Report for Test Area North Operations at the Idaho National Engineering and Environmental Laboratory*, INEL-94/0163, March 1999.

14. QUALITY ASSURANCE

14.1 Introduction

Chapter 14 of the TANO SAR[1] describes the quality assurance program for TAN 653. There are no specific QA requirements for TAN 653.

14.2 References

1. *Safety Analysis Report for Test Area North Operations at the Idaho National Engineering and Environmental Laboratory*, INEL-94/0163, March 1999.

15. EMERGENCY PREPAREDNESS

15.1 Introduction

Chapter 15 of the TANO SAR[1] summarizes the emergency preparedness organization, functions and response at TAN and their integration with the DOE INEEL emergency preparedness program. There are no emergency preparedness organizations, functions, and responses specific to TAN 653.

15.2 References

1. *Safety Analysis Report for Test Area North Operations at the Idaho National Engineering and Environmental Laboratory*, INEL-94/0163, March 1999.

16. PROVISIONS FOR DECONTAMINATION AND DECOMMISSIONING

16.1 Introduction

General information on design features and operational considerations to facilitate future decontamination and decommissioning (D&D) of TAN facilities is presented in Chapter 16 of the TANO SAR.[1] At this time there are no specific plans for D&D of TAN-653.

16.2 Reference

1. *Safety Analysis Report for Test Area North Operations at the Idaho National Engineering and Environmental Laboratory*, INEL-94/0163, March 1999.

17. MANAGEMENT, ORGANIZATION, AND INSTITUTIONAL SAFETY PROVISIONS

17.1 Introduction

Chapter 17 of the TANO SAR[1] presents the information on management, organization, and institutional safety provisions for TAN. Waste Generator Services reports to the The TAN Engineering and Support Services Manager and is responsible for WGS and WGS is ultimately accountable to the TAN Site Area Director.

17.2 Reference

1. *Safety Analysis Report for Test Area North Operations at the Idaho National Engineering and Environmental Laboratory*, INEL-94/0163, March 1999.